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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/506,529	01/31/2005	Kenji Takai	1204.44255X00	1181

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EXAMINER	
LAM, CATHY FONG FONG	
ART UNIT	**PAPER NUMBER**
1794	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/506,529	TAKAI ET AL.	
	Examiner	Art Unit	
	Cathy Lam	1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 October 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *See Continuation Sheet* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4,6,7,10,11,13,15-17,19,21,22,25,26,28,30-34,41-44 and 51-63* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *09-07-2007*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continuation of Disposition of Claims: Claims pending in the application are 1,2,4,6,7,10,11,13,15-17,19,21,22,25,26,28,30-34,41-44 and 51-63.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 25, 2007 has been entered.

In view of the amendment and remarks filed on October 25, 2007, the following rejections are applied to the claims:

Applicant has amended and added some new claims, Applicant is required to point out where in the specification that these amended and newly added portions were derived from, particularly claims 1, 16, 55-56 and 58.

Double Patenting

The Terminal Disclaimer filed on October 25, 2007, has been acknowledged, however one of the US patent applications serial number 11/044,513, in the TD is incorrect. The corrected US patent application serial number is 11/044,533. Applicant is respectfully asked to make correction when reply to this office action.

Claim Rejections - 35 USC § 112

2. Claims 1, 16, 58, 60 and their dependents are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 1 & 16, applicant has changed the scope of the invention by claiming the insulating resin composition to become "said insulating resin composition layer contains polyamidoimide resin as principal ingredient", but some dependent claims (i.e. claims 7, 11, 13, 22, 26 & 28) further claiming another resin material such as cyanate resin and epoxy resin, etc.. It is unclear as to whether or not applicant's referring of the insulating resin composition layer being polyamidoimide resin as the principal ingredient means the polyamidoimide resin plus either cyanate resin or epoxy resin with the polyamidoimide resin being more than 50 wt% in the resin composition layer? Or does it mean polyamidoimide being a MUST EXIST component (regardless of its amount) in the resin composition layer? Clarification is required. Applicant is required to show support from the original specification from which the newly claimed portions were derived.

In claims 1 & 16, it is vague and indefinite as to whether "a chromate treatment" is equivalent to "an anti-corrosive treatment"?

In claim 58, it is structurally indefinite, as to on which surface of the conductor circuit surface do the nickel plating layer and the gold plating layer were formed (i.e the surface to be bonded to the insulating resin composition layer or the surface away from the insulating resin composition layer)? Furthermore, it is unclear which layer (i.e. the nickel or the gold layer) is first formed onto the conductor circuit surface? Clarification is required.

In claim 60, the term"L/S" is indefinite. Clarification is required.

In claims 56 and its dependents, it appears to the examiner that the insulating resin composition layer is either a polyphenylene either resin, a polyamidoimide resin, a cyanate resin or an epoxy resin. Any one of the above resins is a workable resin for applicant's invention.

Claim Rejections - 35 USC § 103

1. Claims 1, 2, 4, 6-7, 10-11, 13, 15-17, 19, 21-22, 25-26, 28, 30-34, 41-44 and 51-63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ameen et al (US 6132589) or Fujiwara et al (EP 1006763 A2).

Ameen teaches a copper foil that is useful for the production of printed circuit boards. The copper foil has a smooth or shiny side and a rough or matte side.

The copper foil disclosed by Ameen is an *untreated* foil, that is the surfaces of the copper foil have not undergone roughening treatment (col 3 L 18-23). Ameen's copper foil has a thickness of from about 0.0002 inch to about 0.02 inch (i.e. 5-500 μm) and has a very low profile surface (col 2 L 43-44 & L 60-63). Ameen defined the term "very low profile surface" being a foil having a surface roughness of 4 micron or less (col 2 L 62-63).

A zinc metal layer is first coated over the copper foil, followed by a chromate layer, both layers function as anti-corrosive layer (col 2 L 50-54). A layer of silane coupling agent is applied to the chromate layer, wherein the silane coupling agent may contain amino group (col 5 L 19-26).

The coated copper foil is brought into contact with a dielectric substrate which is a partially cured prepreg. The resin used for the prepreg can be an epoxy resin or a

cyanate ester (col 6 L 47-59). The epoxy resin is typically a liquid unless curing step is performed (col 8 L 57-62). The epoxy resin may include a conventional amine curing agent or a curing agent other than amine (col 6 L 50-54 & 60-63).

Fujiwara also teaches a copper foil laminate for used in a printed wiring board. The copper foil is a rolled copper foil (i.e. a smoothened surface or no roughening treatment performed on its surfaces).

A bond enhancing treatment is performed onto the copper foil surfaces (page 4 L 16-21). The sequence of forming the bond enhancing treatment includes first forming an alloy layer (2) over the copper foil surface, then coating a chromate layer (3) over the alloy layer (2) followed by forming a silane coupling agent layer (4) (page 4 L 16-19 & page 5 L 29-30).

The alloy layer (2) is comprised of copper, zinc and nickel (page 4 ¶ 23). The examiner is taking the position that the alloy layer (2) and the chromate layer (3) are the claimed anti-corrosive coating layer and the chromate treatment layer. The silane coupling agent (4) containing amino group is applied onto the chromate layer (3) (page 5 L 29-30).

The copper foil that is coated with the anti-corrosive coating layers and the silane coupling agent, is then coated with an epoxy resin varnish (i.e. a liquid epoxy resin) (page 2 L 37-38 & page 11 L 29-30).

The bonding strength after heat pressing & drying of the copper foil laminate is > 0.6 kgf/cm (i.e. equivalent to 0.6 kN/m) (page 11 Table 1, Ex. 1 & 2).

Both Ameen and Fujiwara disclose the present invention except for using polyamidoimide resin as the insulating resin layer. The prior art do not explicitly teach the surface roughness and the thickness of the copper foil. The prior art are also silent about the copper foil which formed into a circuit pattern having a line width of 1 mm.

In view of the prior art teachings, one skill in the art would choose a desired resin material or resin mixture because such discovery involves only routine experimentations, unless applicant can show some specific reasons why polyamidoimide resin is an essential component and by adding such to the resin composition would greatly improve or give an unexpected/extraordinary performance to the product otherwise the examiner takes the position that the prior art would perform the same job.

In view of the prior art teachings, it would have been obvious to choose a surface roughness and thickness for the copper foil because these variables can easily be obtained by rolling process. Ameen discloses that the copper foil having a "very low surface profile" may have a surface roughness of less than 4 μm (col 2 L 62-63). Determining the surface roughness is certainly well within an ordinary skill in the art, and less than 4 μm clearly embraces the 2.0 or 1.0 μm.

Furthermore, it would also be obvious to fabricate a 1mm width circuit line because it is just a matter of design choice.

Regarding to the interfacial roughness between the insulating resin composition layer and the metal foil, the examiner is taking the position that it would be inherent that the interfacial roughness would be the same as the metal foil surface roughness,

because the resin composition layer is a liquid when applied to the metal foil surface, and the liquid would conform to the shape of the metal foil surface.

Regarding claims 56-63, the examiner is taking the position that having additional metal plated onto the copper foil is obvious and not novel in the field of making thin copper foil for printed circuit board (see Johnson, US 6,994,918).

Response to Arguments

2. Applicant's arguments filed on October 25, 2007 have been fully considered but they are not persuasive.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cathy Lam whose telephone number is (571) 272-1538. The examiner can normally be reached on 9am-6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye can be reached on (571) 272-3186. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Cathy Lam

Cathy Lam
Primary Examiner
Art Unit 1794

cfl
December 26, 2007